March 15, 2007

DoD Standardization Conference

Westin Arlington Gateway Hotel in Arlington, Virginia.

Enhancing Multinational Force Capability Through Standardization and Interoperability

Keys to Standardization of Product Life Cycle Data

electronic commerce code management association

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ECCMA 8000 MASTER DATA QUALITY

eOTD ECCMA Open Technical Dictionary

Key to Standardization of Product Life Cycle Data
Contract for ISO 8000 compliant data

Cataloguing data is defined as the minimum number of characteristics required to uniquely identify an item of supply or supply concept.

The contractor, sub-contractor or supplier shall supply technical data for cataloging purposes in electronic format on any of the items covered in this contract as follows:

a. The data shall comply with applicable Federal ISO 22745-30 compliant Identification Guides.

b. The data shall be encoded using concept identifiers from the ECCMA* Open Technical Dictionary (eOTD), an ISO 22745 compliant open technical dictionary.

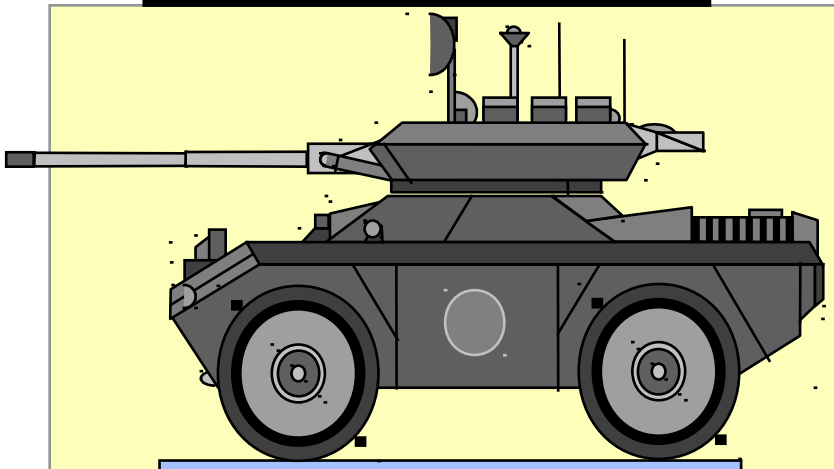
c. The data shall be provided in eOTDr-XML, an ISO 22745-40 compliant Extensible Markup Language (XML) format published by ECCMA*.

d. The data shall be certified as ISO 8000 compliant.

* The Electronic Commerce Code Management Association (ECCMA) (www.eccma.org) is the Dictionary Maintenance Organization for the eOTD, a compliant open technical dictionary as defined by ISO 22745 and can provide technical assistance in meeting this requirement.

Costs of A Weapon System

Weapon system



acquisition costs

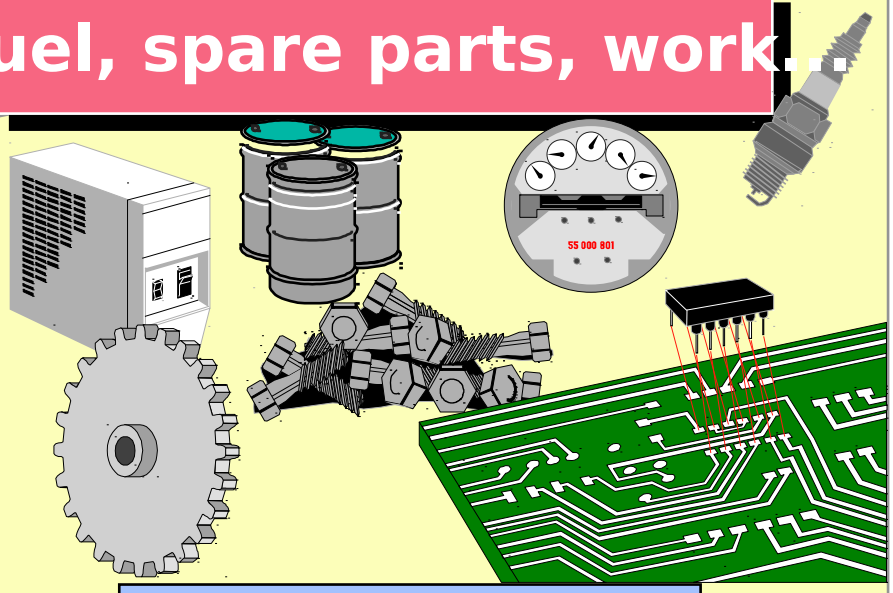
1/3

Political decision

=

specific budget

uel, spare parts, work...



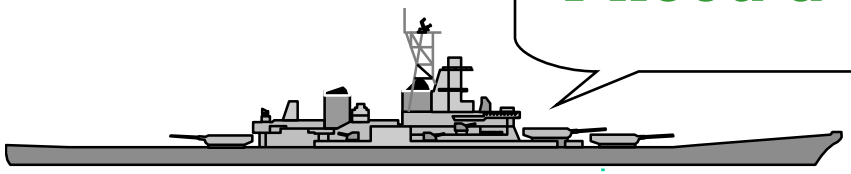
operations costs

2/3

Operating budget
of the armed forces

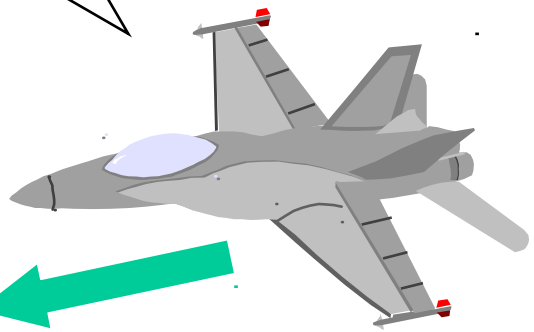
Life cycle cost

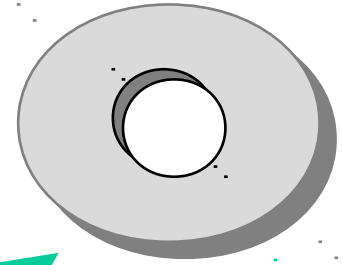
“BC” Before Codification



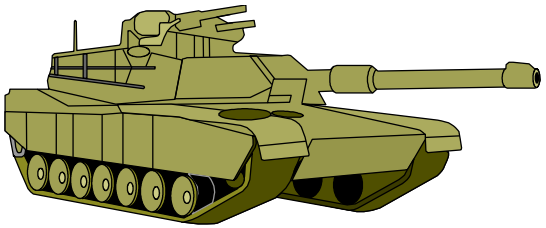
I need a washer

I need a spacer





I need a shim



I need a collar

Reasons for the NCS: Interoperability

All acquired systems shall be interoperable with other U.S. and allied defense systems, as defined in the requirements and interoperability documents.

DoDI 5000.2 Section 2.72

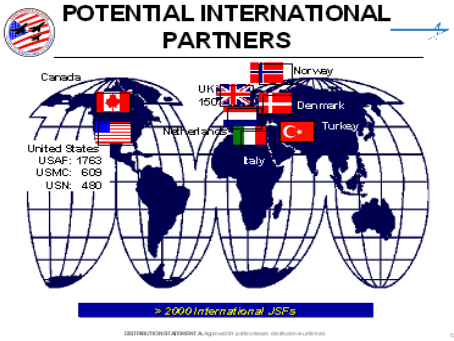
Multinational Cooperation

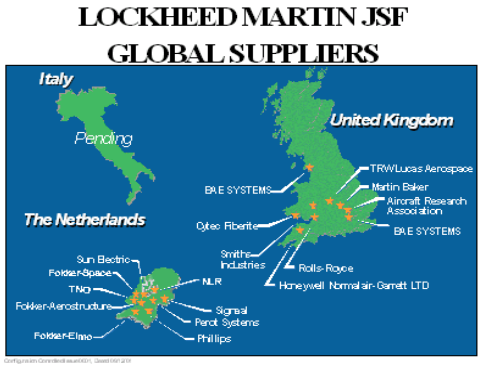
MULTINATIONAL SYSTEMS DEVELOPMENT

ALN	DASA
AS	FLABEL
BAE	TAI
CASA	OPEN

Source: Airt

JSF Partner Nations





NCS is Language Interoper

Saya ada NSN di dalam simpanan. (I have the NSN in stock)

Help, I need NSN 6645-00-248-4925

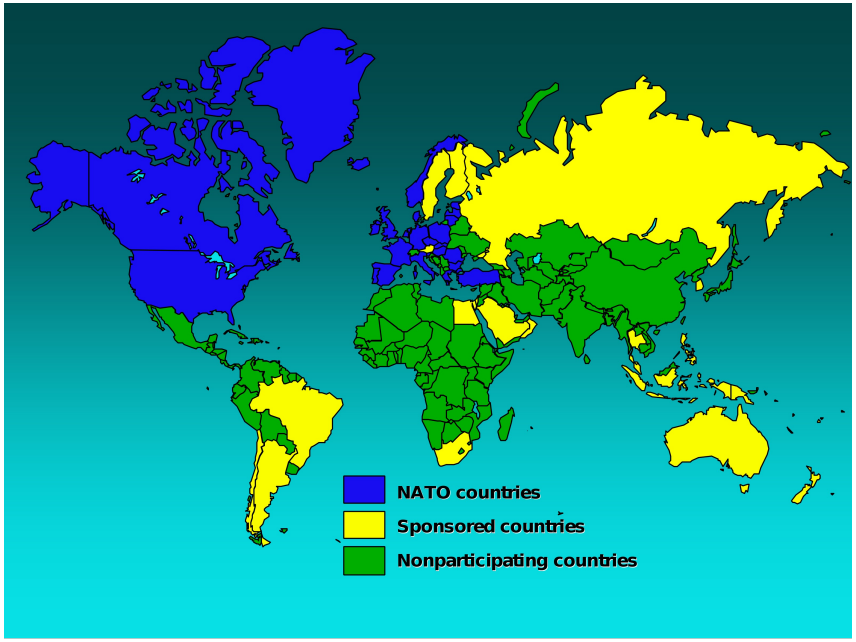
Nie mam w zasobach NSN-a (I have this NSN in stock)

I don't have your NSN... but can order it.
我沒有？要的料號....，但仍可以申請

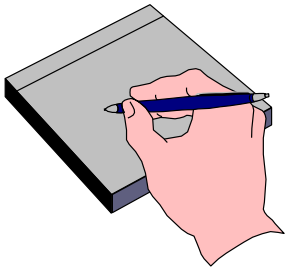
Peaks saabuma varsti (I expect this item soon)

The NATO Codification System (NCS)

- **A common supply language throughout all logistic operations**
  - To enable interoperability
  - To optimize resource management by minimizing duplication in inventories
- **A flexible system that can be tailored to national requirements**
- **An important cornerstone to logistics interoperability**
  - 15+ million NATO Stock Numbers have been assigned
  - 7 million by the U.S. and 8 million by the other NATO countries
  - 31 million reference numbers have been registered on these NSNs
  - These NSNs contain more than 22 million user registrations
  - 1.5 million manufacturers and other organizations are registered



NATO Codification System Chronology



1929

1945 WWII

1949 PL152 SUPPLY CLASSIFICATION

US/UK/CA CLASSIFICATION

1952 PL436 CODIFICATION SYSTEM

1954 STANAG 3150

NATO

1956 STANAG 3151

1966 DLSC

1974 NCB CODE

1978

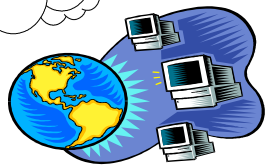
1991 PFP

1994 PACS

DESERT STORM

BASELOG

1999



E-Commerce

ECCMA
electronic commerce code management association

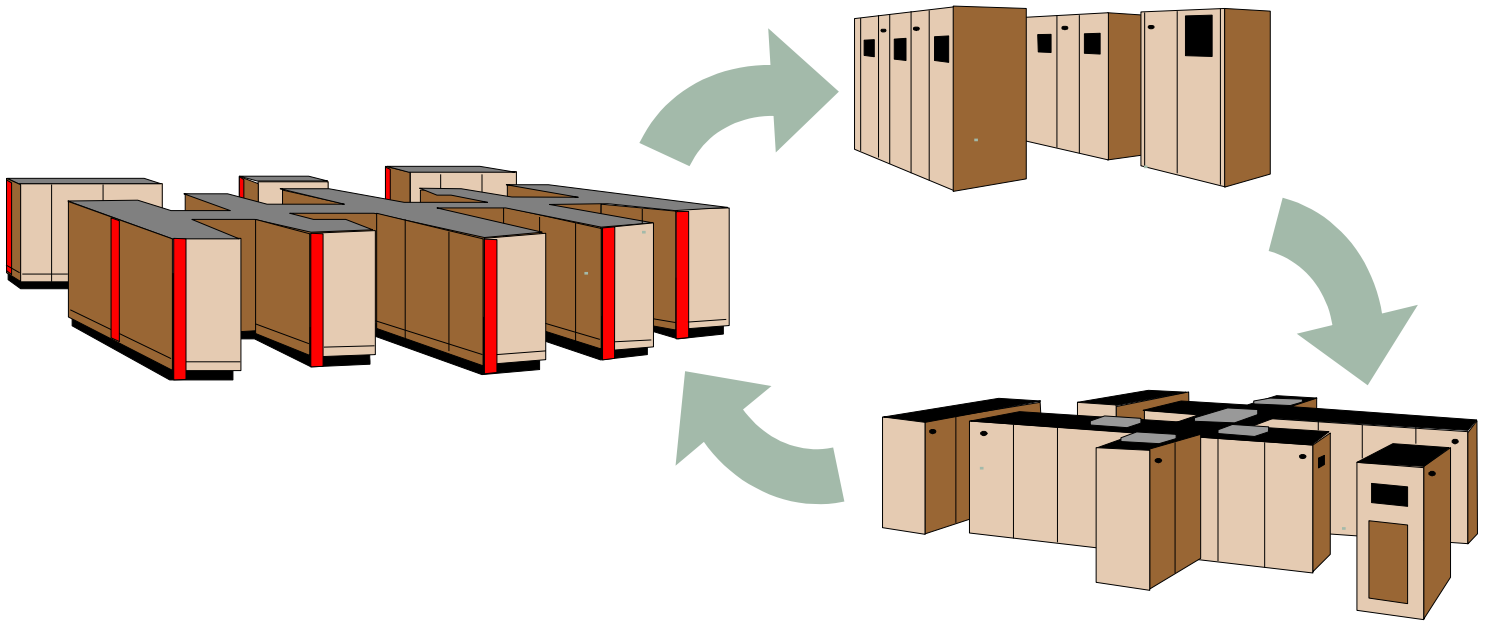
ECCMA
electronic commerce code management association

A not for profit membership association with for mission increasing the quality and lowering the cost of Customer, Supplier, Material and Service Master Data.

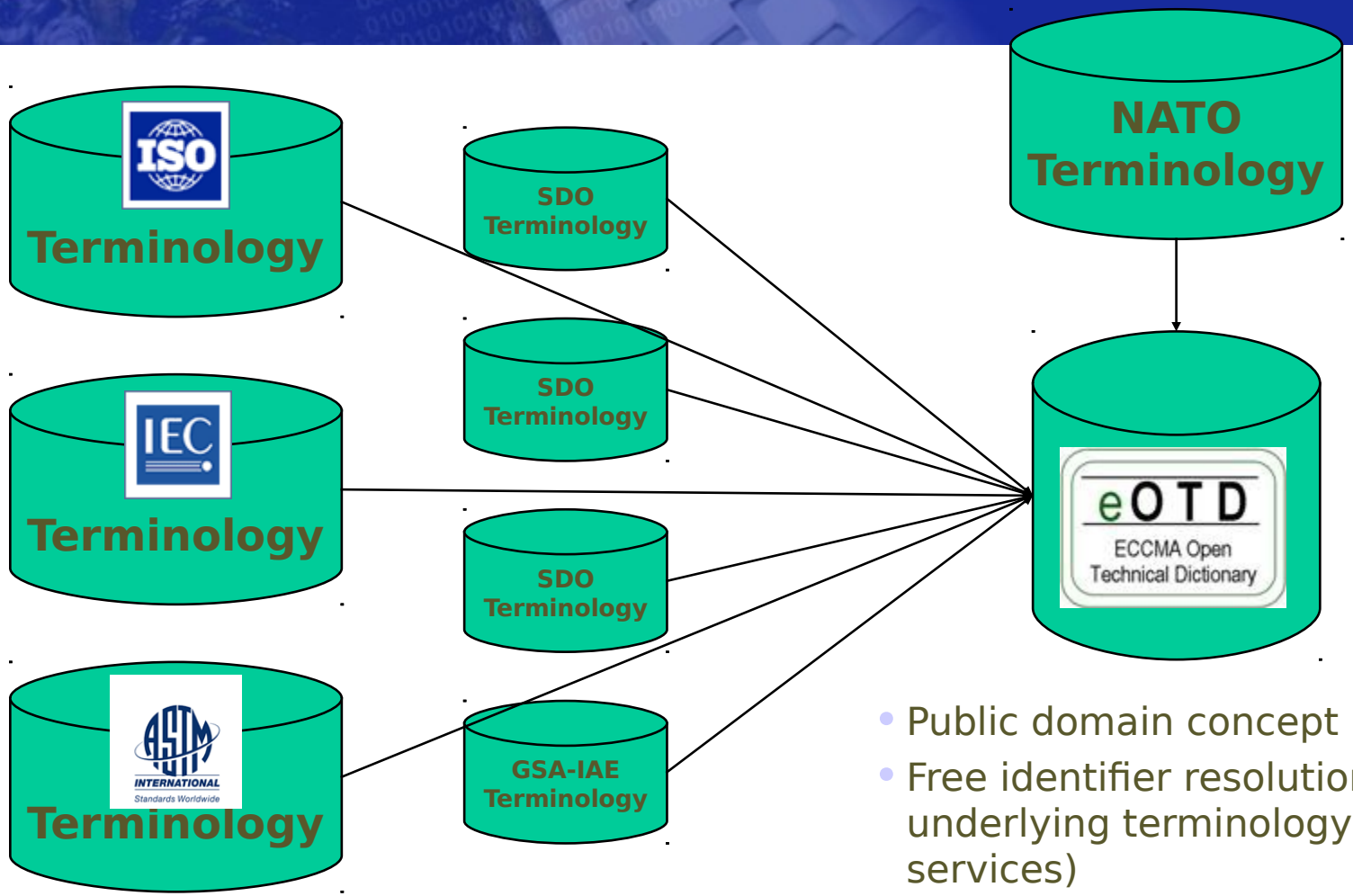
Promoting NATO codification as an International Standard for Mater Data under ISO 22745 and Master Data Quality under ISO 8000

Vision of the Future

- **To provide a means of maintaining master data through the life cycle of a product, independent of any particular application or computer system *(neutral exchange – long term retention)***
- **To improve the quality and availability of data through integration with manufacture and supplier systems**



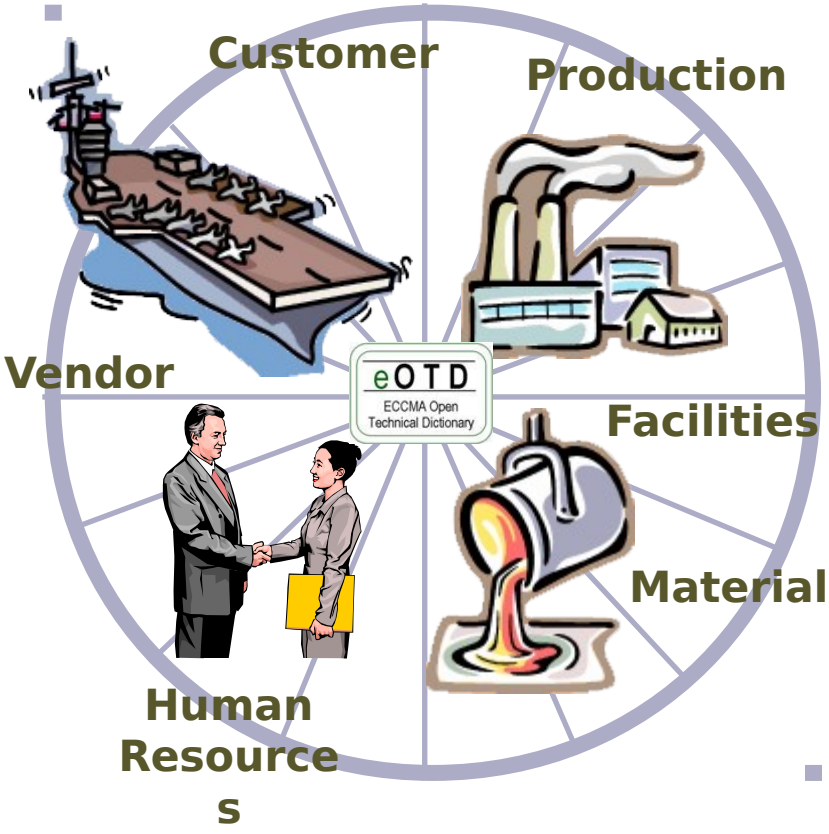
✓Standard Terminology



- Public domain concept identifiers
- Free identifier resolution to underlying terminology (web services)
- Hyperlink to source standards
- Multilingual
- Multiple terms, definitions and images linked to single concept identifier

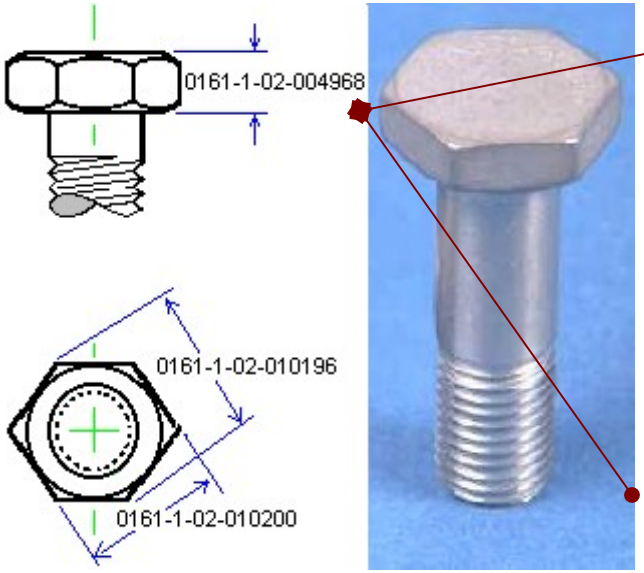
✓Common Concept Encoding

- Across the supply chains
- ERP masters: vendor/customer/material
- Manufacturing/production
- Facilities/raw materials
- Human resources
- Data life cycle management – design through disposal



Common metadata mapping across applications!

✓Common Concept Encoding



Property ID	Value	Measure ID
0161-1#02-046898#1	0161-1#07-014684#1	
0161-1#02-027375#1	3225020037	
0161-1#02-023822#1	1.0	0161-1#05-000798#1
0161-1#02-010200#1	1.450	0161-1#05-000798#1
0161-1#02-010196#1	1.653	0161-1#05-000798#1
0161-1#02-004968#1	0.591	0161-1#05-000798#1
0161-1#02-027376#1	10	
0161-1#02-027378#1	0.80	0161-1#08-000168#1

eOTD Identifier Coded

Property term	Value	Measure term
eOTD CLASS NAME	BOLT:MECHANICAL	
PRODUCT NUMBER	3225020037	
NOMINAL THREAD DIAMETER	1.0	INCHES
WIDTH ACROSS FLATS	1.450	INCHES
WIDTH ACROSS CORNERS	1.653	INCHES
HEAD HEIGHT	0.591	INCHES
COUNT PER PACK	10	
PACK PRICE	0.80	US DOLLAR

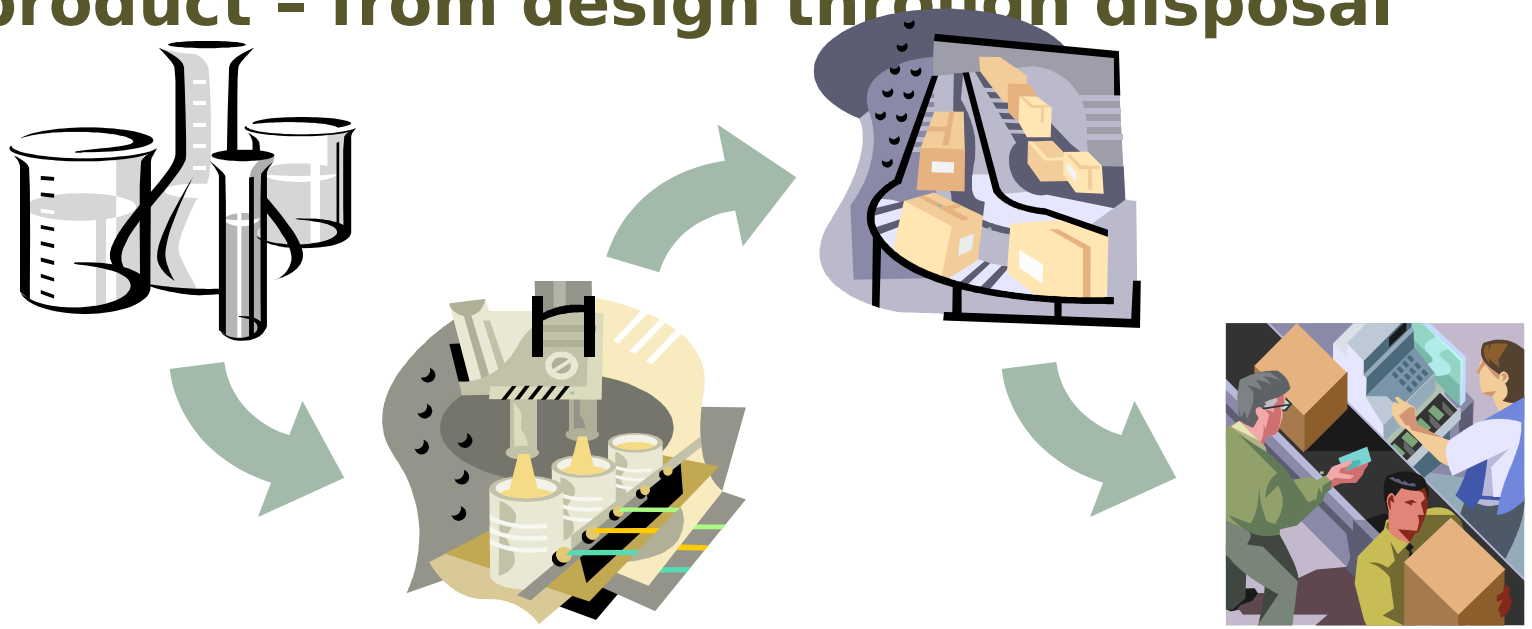
eOTD Identifiers Resolved

Machine Bolt; Product Number: 3225020037; Nominal thread diameter: 1.0 inches; Width across flats: 1.450 inches; Width across corners: 1.653 inches; Head height: 0.591 inches; Count per pack: 10; Pack price: $0.80 (M-Bolt;NTD1.0”;WAF1.45”;CPP10)

Rendered

✓ A Vision Realized

- **The NATO Codification System is the foundation of an international standard for Mater Data**
- **The eOTD is an open standard for encoding Master Data through the life cycle of a product – from design through disposal**



eOTD
ECCMA Open Technical Dictionary

Benefits to Members of NATO AC/135

- **Opportunities for improvement of the NATO Codification System through increased industry participation**
- **Promotes NCS approach as an ISO standard**
- **Lower cost of codification: Reduction of labor hours**
- **Higher quality data through integration with manufacturers and suppliers**

Goal: Electronic transfer of characteristic data from our suppliers and manufacturers to NATO Codification Bureaus

CATALOGING AT SOURCE

1. Faster – 2. Better– 3. Cheaper

Benefits to Data Users

- **Dramatically improved Master Data**
  - **Application interpretable data requirement statement**
  - **Unambiguously labeled data**
  - **Automated gap analysis**
- **Reliable data integration**
- **Reliable data interoperability**
- **Data provenance at the data element level***

**Work in progress*

Data Quality

What is the significance of Data Quality?

It impacts our day to day work in thousands of small ways

Dear ????

John, Patrick
King, Yee
Pyka, Uwe
Wang, Ping

What is the significance of Data Quality?

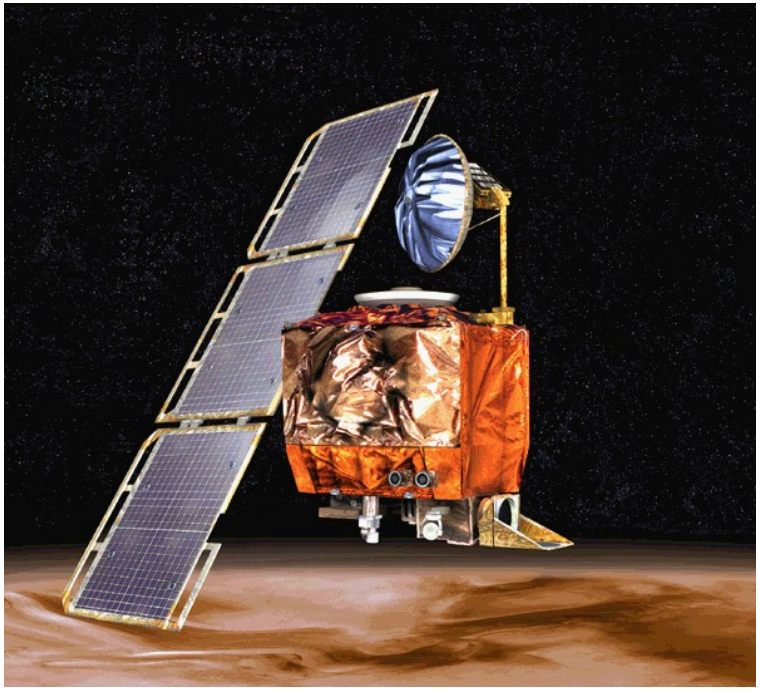
and in larger ways too……..

E	T	D	S	F
Begin	9/23/99 02:01:00	121,900,000	12,300	143.878
End	9/23/99 02:17:23		9,840	

Event	Time	Distance	Speed	Force
Start	19990923 05:01:00	196,200,000	5.5	640
Finish	19990923 05:17:23		4.4	

In this case $125,000,000

The price of a Mars Climate Orbiter!



Mars Orbit Insertion Burn	M/D/Y HH:MM:SS PDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (miles)	Speed (miles/hr)	Force (Pounds)
Begin	9/23/99 02:01:00	121,900,000	12,300	143.878
End	9/23/99 02:17:23		9,840	

Mars Orbit Insertion Burn	YYYYMMDD EDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (km)	Speed (km/sec)	Force (Newtons)
Start	19990923 05:01:00	196,200,000	5.5	640
Finish	19990923 05:17:23		4.4	

What is the significance of Master Data Quality?

It impacts the bottom line!

"Boeing currently buys 200 different kinds of safety glasses and 80 different shades of white paper. The defense and commercial aircraft divisions each negotiate for their own aluminum and titanium. Why can't we buy two or three kinds of safety glasses? Why can't we have standard part numbers that go across the enterprise?"

James F. Albaugh, CEO Boeing Integrated Defense Systems,
Business Week March 13, 2006

eOTD
ECCMA Open Technical Dictionary

International Organization for Standardization

- 156 National standard organization members (one per country)

  (AFNOR, ANSI, BSI CNIS, DIN, Standards Australia …….)

- 192 Technical Committees
  - 3 000 Technical bodies
  - 50 000 domain experts
- Central Secretariat in Geneva
  - 150 staff
- ISO TC 184 Industrial automation systems and integ
  - ISO TC184 SC4 Industrial data (STEP)

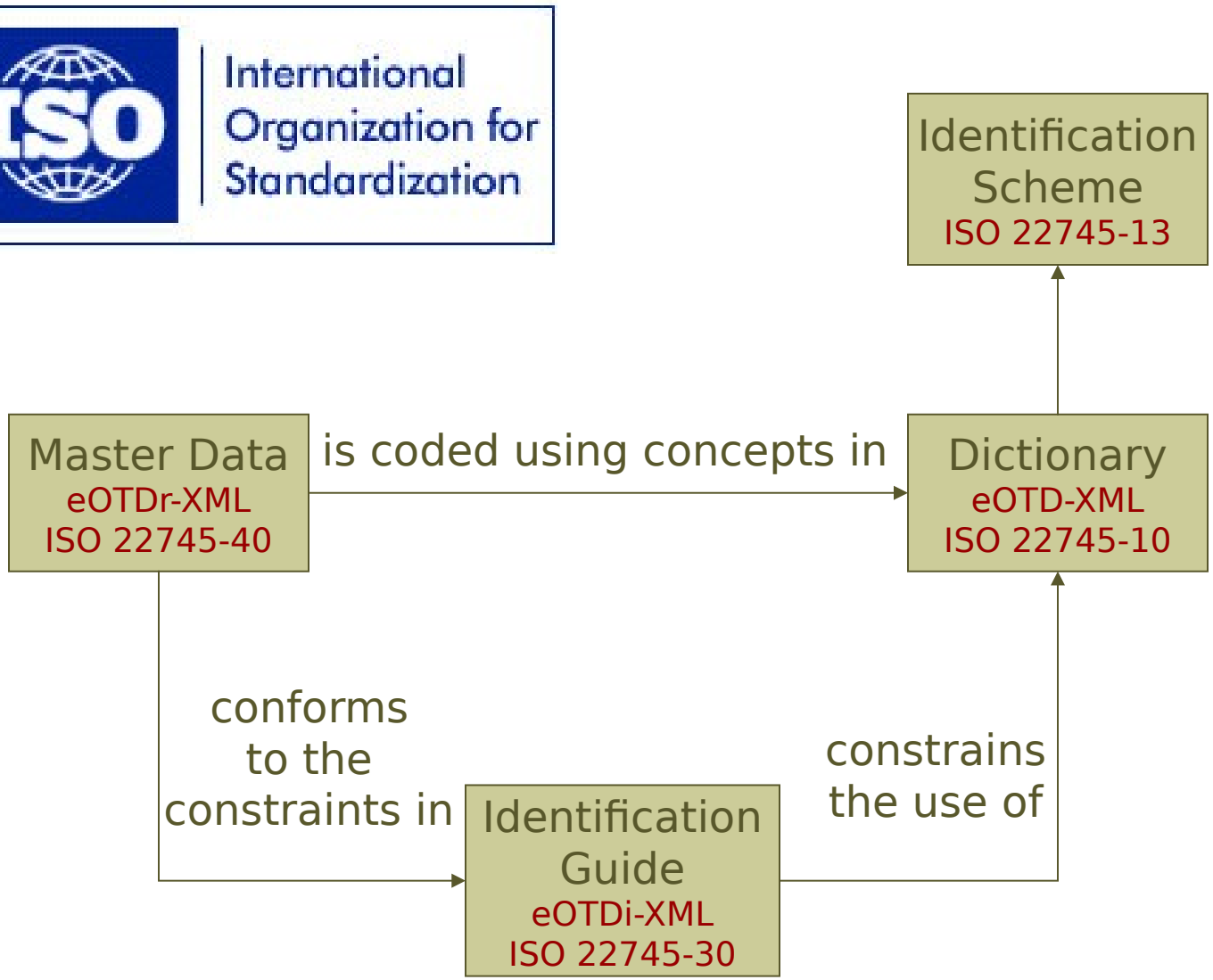
DLA funded projects

- **ISO 22745 (open technical dictionaries and their application to Master Data)**
- **ISO 8000 (Data Quality)**

ISO International Organization for Standardization

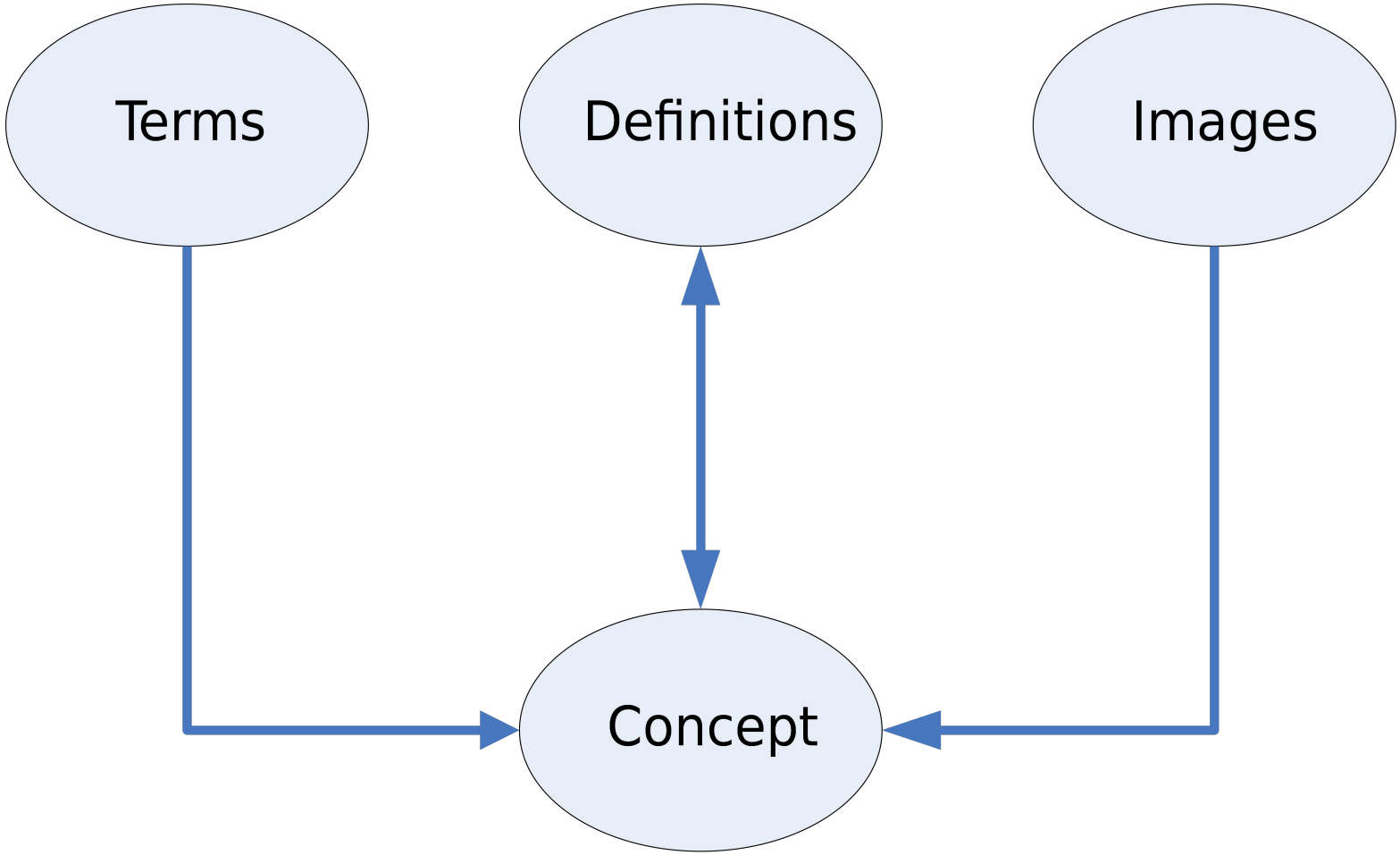
ECCMA electronic commerce code management association

eOTD Architecture – ISO 22745



eOTD data models

eOTD Dictionary (metadata)



eOTD data models

Names | | Definitions | | Images

Concept detail: 0161-1#01-006362#1

Concept Names	
Name	**Standard References**
BALL SCREW	ISO/DIS 3408-1
BALLSCREW ASSEMBLY	FIIG A305

Concept Definitions	
Definition	**Standard References**
An assembly comprising a ball screw shaft, ball nut(s) and balls, and which is capable of converting rotary motion to linear motion and vice versa. The rolling elements of the assembly are balls. *Notes* • Depending on the application, ball screws are designed either with backlash or without backlash (preloaded). • To meet individual requirements six standard tolerance grads 0, 1, 3, 5, 7 and 10 are available. The tolerances for travel deviation are in accordance with the standard tolerance grads IT0, IT1, IT2, IT5, IT7 and IT10 of ISO 286-1:1988, ISO system of limits and fits - Part 1: Bases of tolerances, deviations and fits. Usually standard tolerance grade 0 to 5 are preloaded, and grades 7 and 10 are not preloaded.	ISO/DIS 3408-1
A self-contained power transmitting device designed to convert rotary motion to linear (straight line) mechanical movement. Must be comprised of a ball nut, pillow block(s), screw shaft and such accessories as required for the specific moving and positioning of other components.	FIIG A305

eOTD
ECCMA Open Technical Dictionary

Master Data Quality - ISO 8000

The foundation of the Standardization of Product Life Cycle Data and international data Interoperability

Master Data quality – ISO 8000

Supplier and manufacturers recognize that:

- data integration is one of the keys to a long term relationship
- the ability to provide their customers with quality data is a significant differentiating factor.

Suppliers and manufacturers are:

- publishing the specifications of their products, capabilities and services on their web sites.
- looking to increase their visibility and understand that the best way to do this is to improve the quality of their data.
- looking for a Standard that they can use to identify the quality of their data.

eOTD
ECCMA Open Technical Dictionary

Master Data quality – ISO 8000 part 110

Syntax

Each data set shall contain a reference to the syntax to which the data set complies....The reference shall be resolvable to the specification of the syntax through a mechanism that is publicly available, free of charge.

Semantic encoding

Each data element value shall reference all concepts necessary to unambiguously define its meaning. Each reference shall be to a concept dictionary entry contained in a concept dictionary that supports an interface for free and anonymous resolution of a concept identifier.

Conformance to requirements

Each data set shall contain a reference to the data requirements statement to which the data set complies. The reference shall be a globally unambiguous identifier that was used to encode the data set. The reference shall be resolvable to the data requirements statement through a mechanism that is publicly available, free of charge. The data requirements statement shall be publicly available.

Steps to implementation

Define your data requirements in terms of ISO 22745

Create eOTDi-XML Identification Guides that define the data sets you require

Implement ISO 22745 for the exchange of master data

Map your metadata to eOTD Identifiers and use eOTDr- XML as your preferred master data import format

Contract for ISO 8000 compliant data

Add ISO 8000 compliance as a requirement for master data

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Contract for ISO 8000 compliant data

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Thank you

Questions?

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